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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,831	07/24/2003	William R. Dolbier JR.	UF-332CXC1	3748
7590 05/25/2004			EXAMINER	
Frank C. Eisenschenk, Ph.D. Saliwanchik, Lloyd & Saliwanchik A Professional Association 2421 N.W. 41st Street, Suite A-1 Gainesville, FL 32606			VOLLANO, JEAN F	
			ART UNIT	PAPER NUMBER
			1621	
DATE MAILED: 05/25/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/627,831	<b>Applicant(s)</b> DOLBIER ET AL.	
	<b>Examiner</b> Jean F. Vollano	<b>Art Unit</b> 1621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/1/04, 2/13/04</u> . | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

### *Priority*

1. Applicant has placed in the specification the following –“ This application claims the benefit of U.S. Provisional Application Serial No. 60/448,831, filed February 21, 2003, and also claims the benefit of U.S. Provisional Application Serial No. 60/399,044, filed July 25, 2002.”

There is no foreign priority being claimed.

### *Specification*

2. The disclosure is objected to because of the following : The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The claim language is broader than the example. The example is the only reference to this process which used dimethyl dichloride as the solvent and uses other specifics not generically found in the rest of the specification. For instance the example states

“Synthesis of pentafluorosulfanylbenzene: A 100-mL round bottom flask water condenser was charged with 1-pentafluorosulfanyl-2, 4, 5- trichlorocyclohexane (4.1g, 0.012M) and 60 mL of NaOEt (1.59M solution). The mixture was vigorously stirred at ambient temperature overnight. Water was added, and the solution was extracted with CH<sub>2</sub>Cl<sub>2</sub>. The extract was washed with water (3 times) and dried over MgSO<sub>4</sub>. Evaporation of the solvent furnished a mixture of a liquid and a white solid. The solid was filtered off, leaving

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pentafluorosulfanylbenzene (1.95 g, ca. 0.01M) in a yield of about 79%. Overall yield calculated from 4, 5-dichloro-1-cyclohexene: about 71%...”

Claim 13 recites “3. A method of making pentafluorosulfanyl benzene comprising the steps of:

- a) mixing 4, 5-dichloro-1-cyclohexane,  $\text{CH}_2\text{Cl}_2$ ,  $\text{SF}_5\text{Cl}$ , and a catalyst selected from the group consisting of dialkylboranes, trialkylboranes, 9-borabicyclo(3.3.1) nonane, and mixtures thereof;
- b) evaporating the solvent from the produced thereby;
- mixture of step a) and recovering the product c) contacting the product obtained in step b) with a solution of sodium ethoxide ( $\text{NaOEt}$ ); d) adding water to the solution of step c) and extracting said solution;
- e) washing the extract of step d) and drying the extract over a dessicant;
- f) allowing solvent evaporation from the extract of step e); and
- g) recovering pentafluorosulfanylbenzene from the extract of step f.

This as written is not found in the specification to the scope being claimed . However the claims are original and as written they are part of the specification and can be placed into the specification .

Appropriate correction is required.

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*Claim Rejections - 35 USC § 112*

3. Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation of making “pentafluorosulfanyl substituted compounds” It is unclear what the metes and bounds are of this limitation? It is unclear if the compounds are organic or can be inorganic or organometallic or all three. If that is the case then there may be a scope of enablement problem. However as written it is unclear what is being claimed as compounds. For example the compound  $\text{SF}_5\text{N}=\text{C}=\text{S}$  is an inorganic compound named pentafluorothiocyano N sulfur is this being claimed as being produced? There are organic compounds wherein the S of the pentafluoro group is not attached to a carbon but a nitrogen in pentafluoro octyl carbamate-N- sulfur  $\text{Me}(\text{CH}_2)_7\text{-O-C}=\text{O N(H) SF}_5$ . There is pentafluorosulfur chloride is this being claimed in this wording and this is also a starting material. The term compound in the claim is confusing as to what the metes and bounds are of the instant invention.

Claim 1 recites the limitation of “comprising one or more compounds comprising one or more functional groups selected from .... substituted or unsubstituted aliphatic groups, substituted or unsubstituted aromatic groups...” First of all it is unclear how one can have one or more functional groups with an unsubstituted aliphatic, aromatic, alicyclic, alkene, alkyne etc. Does the claim consider  $\text{CH}_3$  a functional group. It is such in general organic chemistry but the term functional group here is confusing as to what is included. There is no guidance in the specification to the metes and bounds of the term functional groups or indeed even what the

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generic term means. There are some examples of what may be considered a functional group but this does not give a clue to the metes and bounds of what is being claimed.

Claim 1 recites the limitation of alkene groups and then styrene groups. A styrene group is an alkene and it is unclear what else is being claimed by the inclusion of a styrene group?

The claim also recites disubstituted alkene groups such (e.g. 2,2-disubstituted alkenes). First of all the e.g. is confusing as to whether the claim is claiming only 2, 2-disubstituted alkenes and it is also unclear what is considered a 2, 2-disubstituted alkene. Is a 2, 2 dimethyl alkene a disubstituted? How is this group different from an alkene or does disubstituted mean two unsaturations. Also how does the non terminal alkene group differ from all the others. The claim goes on and rambles to list cyclohexene groups and cyclohexadiene groups etc. There seems to be almost a laundry list of any compounds that can be thought of. Then the list seems to add specifics or subgenres which make it unclear if the subgenus is being claimed or exemplified as an example of the genus. The whole section of compounds and their "functional groups" and their substitutions are confusing as to what applicant is trying to claim in the instant process. Remember that applicant must be in possession of the full invention at the time of filing and the invention must be written in a clear and concise manner pointing out the metes and bounds that are being claimed as part of the instant invention. Please review the specification and rewrite this list pointing out the metes and bounds of the instant invention and give support for any functional groups and substituents and please on the record tell where in the specification a substituent is different from a functional group or why there are two terms that seem to mean the same thing. Also there is one or more compounds in the claim language are mixtures of

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compounds being prepared? The claim is so confusing that it is hard to figure out what is being claimed.

In claim 1 section b) there is the limitation of “catalyst(s)/initiator(s)” The slanted line is confusing in this context. Does it mean a catalyst or an initiator ? Does it mean a catalyst and an initiator? Does it mean either or both? Or does it mean that the catalyst is an initiator. The wording is confusing as to what is being claimed. Claim 12 has the same problem.

In section c) there is a miss typing of “SF<sub>5</sub>CL” it should be - - SF<sub>5</sub>Cl --.

Claim 2 recites the limitation of wherein “the reaction is allowed to proceed to completion “ This is confusing as to what is meant by the limitation. Usually if one is making a product it is allowed to react until the product is formed in as large a yield as possible. Does this limitation mean that it proceeds until there is no more starting material left ? Does it mean that it proceeds until there is some side reaction that starts taking the product and making other products? Does this mean until the greatest yield possible for the product? The claim is confusing as to what criteria are being claimed for it to reach completion.

Claim 3 recites the limitation of “comprising an elimination or oxidation step” This is very confusing. Is the step making the product as claimed in claim 1 which is needed because of some functional group or substituent? Or is the elimination or oxidation making a different product which has not been pointed out. The claim language makes the claim confusing and very vague and indefinite as to the metes and bounds that are being claimed in the instant invention. The same problem occurs in claims 4 and 5. ( is the product being dried or is the further reaction product which is different being claimed?) Claims 9-11 have the same problem.

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Claim 12 recites a limitation of “ prior to the combination of the solution containing SF5CL ( again the CL is a typo) and the solution containing a compound.” There is a solution containing one or more compounds in 2) and the limitation is to a compound. Is this the solution that is “one or more compounds” or another compound.

Claim 13 recites the limitation of evaporating “the solvent” there is no reference to a solvent in step a) .

Claim 13 recites “the mixture of step a)” Is the limitation referring to when there is a catalyst mixture thereof or is it referring to the reaction mixture which does not have to have catalyst mixture?

Claim 13 recites “recovering the product produced thereby” According to the specification the only product would be 1-pentafluorosulfanyl-2, 4, 5- trichlorocyclohexane that is found in the specification. Is this the product or is there another product? If so what is the product being claimed?

The claims are seemingly trying to get so much into them that may or may not be in the specification that they are completely confusing both in the generic claim and the dependent claims for reasons cited above. The claims are replete with 35 USC 112, 2<sup>nd</sup> problems. The examiner has given examples of those problems . However this is not an exhaustive list. Applicant is asked to review the claims and make appropriate corrections for other 112, paragraph 2 problems. Applicant is also asked to review the claims and to rewrite them in a clear and concise manner pointing out the metes and bounds of the instant invention . There seems to be different processes for the olefins and the alkynes from the aliphatic groups and the aromatic



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groups. The olefins and alkynes seem to be an addition reaction which cannot be the case with the aliphatic or aromatic groups. This may be part of the problem.

4. The examiner will give some prior art and not comment further until the claims are free of most of the 112, 2 problems expect to say the prior art process of forming SF<sub>5</sub> structures does not use borane catalysts except for Organic Letters which is not prior art.

Journal of Fluorine Chemistry 107 pp 23-30, 2001, on PTO 892 teaches a process for preparing SF<sub>5</sub> long chain carbon systems but the reaction is done in a oxygen –polar solvent not in an aliphatic hydrocarbon nor is there a catalyst which is a borane being used.

Tetrahedron 56 ( 2000) on PTO 1449 and US 5,741,935 on PTO 892 teaches a method for preparing aromatic sulfurpentafluorides but the method begins with a disulfide not a pentafluorosulfurchloride.

WO 9922857 teaches a process of preparing a 4-nitrophenyl pentafluoro sulfur using a trifluoro sulfur in acetonitrile and oxidizing it to S<sup>+6</sup>. (PTO 892)

US 3,102,903 on PTO 1449 teaches the reaction of SF<sub>5</sub>Cl with olefins using a nickel iron molybdenum alloy catalyst.

Organic Letters 2002 on the PTO 1449 teaches the instant invention using the same catalysts but it is by applicant and less than one year since filing.

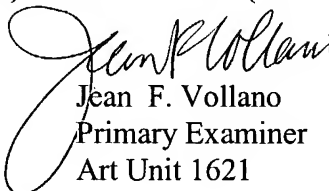
US 5,441,720 teaches the preparation of pentafluorosulfanylnitramide salts using NSF<sub>3</sub>.(PTO 892).

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean F. Vollano whose telephone number is 571-2720648. The examiner can normally be reached on Monday-Thursday 6:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann Richter can be reached on 571-272- 0646. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jean F. Vollano  
Primary Examiner  
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May 23, 2004